

REMARKS

Independent claim 8 and claims 12 and 13 depended therefrom, and independent claim 16 remain in this application for examination, claims 19-24 having been withdrawn from consideration as having been constructively elected by original presentation for prosecution on the merits. Applicant respectfully traverses this rejection because according to the present invention, composite piece 5 can only be made by explosive plating of aluminum and steel. As has been set forth in Applicant' Summary of the Invention at page 2, "by using fasteners which provide clamping or frictional connections, for example by screwing two components together, it is very difficult, only to the different thermal coefficients of expansion, to connect the components tightly enough together so that the sealing of the flow pads in the plate heat exchanger is insured permanently. "It has also been pointed out in the Summary of the Invention that aluminum and steel can not be welded to one another at least on an industrial scale, and in the context of this invention such metals are considered non-weldable to one another. Clearly, the whole purpose of the invention is to provide an intermediate piece or connecting piece which has steel on one side for welding to a steel header and aluminum on the other side for welding to aluminum sheaths forming heat-exchange passages.

Specification:

The specification has been amended to provide a basis therein for the recitation in claim 17.

Amendments After Final:

The amendments after final present no new issues and reduce the number of claims on appeal. In essence, the subject matter of claim 15 is included in the subject matter of claim 8 and claim 15 has been cancelled. Amendments to claim 16 add no new limitations, but merely place claim 16 in a format which conforms to standard United States patent practice and idiomatic English.

Response To Arguments:

The Examiner has given no patentable weight to the limitation "explosive plating". By giving no patentable weight to this limitation, the method of forming the device which is critical to Applicant's invention is dismissed as not germane to the issue of patentability. It is respectfully submitted that the steel piece which has been explosively plated with aluminum and comprises an intermediate piece or connecting piece, such as Applicant's piece 5 shown in Figs. 1 and 2, is a structural element and that there is no other way to describe this claimed element. Perhaps the Applicant could describe the element as being made of steel and aluminum explosively bonded to one another, which would be an acceptable alternative to "having been bonded together by explosive plating", but it is respectfully submitted that the two concepts are identical in that the two concepts inherently recite the method of explosive plating or explosive bonding. It is respectfully submitted that there is no other way to describe a bond formed by an explosion other than to use the terms "explosion" or "explosive." Adhesively bonding aluminum to steel is clearly not the same concept because it requires the use of a third material, i.e. an

adhesive. Fastening aluminum to steel by some mechanical means such as a clamp does not bond aluminum and steel together because if the fastener is moved then the aluminum and steel pieces are no longer held in engagement. Mechanically deforming opposed aluminum and steel elements hold them together is not bonding either, because mechanical deformation requires mechanical interference to provide resistance to separating the elements. Moreover, mechanical deformation is certainly not an appropriate way to provide a connector plate such as Applicant's connecting piece since mechanical deformation requires distortion.

Rejections Under 35 U.S.C. §103:

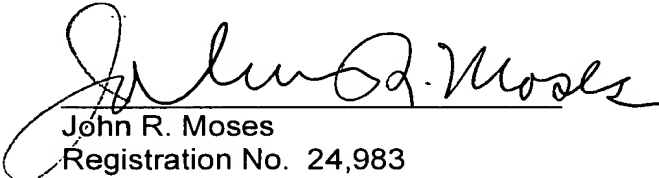
Claims 8, 12, 13 and 15-18 have been finally rejected as unpatentable over Davidian et al. '662 in view of Eiji '288. Applicant again traverses this rejection which is clearly not sustainable because there is no element in Davidian et al. '662 which corresponds in any way to Applicant's claimed to intermediate member 5 (claim 8) or connecting piece 5 (claim 16). Consequently, inserting a connecting piece is taught only by Applicant's own disclosure. In Davidian et al., the headers 1 are shown attached directly to the housing 7 having the corrugations 6. There is no intermediate member whatsoever disclosed. Only Applicant discloses an intermediate member.

The Examiner relies on JP'288 to cure this deficiency of Davidian et al. '662. It is respectfully submitted that there is no disclosure of just how the steel member 4 and the aluminum member 5 are themselves held or bonded together. The Abstract of JP'288 merely states that the steel materials are joined to one another and the aluminum

members are joined to one another, but there is no disclosure of how the materials 4 and 5 are joined to one another other than being "so laminated" that they come into contact with one another. Applicant specifically states that his aluminum piece 6 is explosively bonded to his steel piece 7 so as to form an integral unit. Clearly, the disclosure of JP'288 is deficient in explaining the bond between steel member 4 and aluminum member 5. It is respectfully submitted that it is improper for the Examiner to ignore Applicant's explosive bonding limitation so as to justify combining Dividian et al with JP'288.

In that this is a full and complete response to the Final Office Action of July 16, 2002, this application is now in condition for allowance. If the Examiner for any reason feels a personal conference with Applicants' attorneys might expedite prosecution of this application, the Examiner is respectfully requested to telephone the undersigned locally.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please amend the specification as follows:

The paragraph bridging pages 4 and 5 has been amended as follows:

A frame 5 is welded to header 3, and the thus prepared header is then welded gastight to intake opening 2. In order to be gastight, the intake opening 2 of the housing 1 has a selected area, and the header 2 has a corresponding outlet area with the frame 5 forming an intermediate piece disposed therebetween also enclosing the corresponding area. Frame 5 is depicted more precisely in Figure 2. Frame 5 consists essentially of an aluminum layer 6 and a steel sheet 7, which are connected to one another using an explosive plating process. The thus produced plate heat exchange is distinguished by high strength and is preferably used in high-pressure applications. For further details of the explosive plating process, reference is made to the literature, for example, the attached brochure by Dynamit Nobel entitled ADynaplat Verbindungen durch Sprengstoff.

IN THE CLAIMS:

Please amend the claims as follows:

8. (Twice Amended) A plate heat exchanger block comprising: a an aluminum or aluminum housing, at least partly within said housing a plurality of aluminum or aluminum alloy sheets (2) of at least partially corrugated metal arranged parallel to one another and forming a plurality of heat-exchange passages, at least one steel header (3) in communication with at least some of the heat-exchange passages, wherein at least two parts (1, 2, 3) of the plate heat exchanger block consist essentially of aluminum metallic materials that cannot be welded to one another and wherein the plate heat exchanger block includes an intermediate piece (5) between the header (3) and the heat exchange passages (2) containing the plurality of sheets, the intermediate member having a steel part facing the header and an aluminum part facing the housing, the parts having been bonded together by explosive plating wherein the intermediate piece is welded, aluminum to aluminum, to at least one of the (a) the housing and (b) the corrugated sheets.

16. (Twice Amended) A heat exchange header for attachment to a heat exchanger having aluminum components, the heat exchange header consisting essentially of steel and including a connecting piece having first and second sides, the connecting piece consisting essentially of steel on one side and consisting essentially of aluminum explosively bonded to the other side of the aluminum being explosively bonded to the steel, said header being welded to the steel side of said connecting piece.